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ABSTRACT

Disciplines such as multimedia, 3-D animation, and video depend on a merging of creativity and technology, and students' classroom and job market success in these fields also depends on their ability to synthesize artistic and technological expertise. Today's students are well-versed in computer use, and often this facility causes them to be impatient with more traditional tools and methods. More time needs to be spent on artistic basics: rudimentary drawing techniques, the human form, and design. The introduction of computers into classrooms, often to the exclusion of courses such as music or art, are defrauding students of the opportunities to learn to apply their talents in these fields. In fields where creativity is to be fostered, students must be taught that the ideas and content of their work must precede and supersede the technological implementation of the work. (Contains 15 references.) (EF)

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# Technology in the Creative Classroom

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Today's students, as opposed to those even of four to five years back, come to the classroom well-versed in the use of the computer. My students, including those from overseas, come to the classroom knowing, at a bare minimum, how to use a word processor. They therefore have an intimate knowledge of the Windows-based or Macintosh-based interface. In addition, they all have experience using the Internet, which, together with electronic games, has promoted most of their computer capabilities. They have spent untold hours in high school playing games, conducting searches for their various interests on the web, or socializing via chat rooms with their friends. So when they arrive in the college classroom, this facility on the computer can make them impatient when required to use more traditional tools.

As a trend, this is due to continue and to accelerate. A recent search of the trade magazines indicated that first among the top 50 phrases used for searching through Lycos.com (as listed in their http://50/lycos/com for the week of March 20th, 2000) was Pokéman. The most visited website was Pokéman. The implications of these statistics are staggering, especially when you consider that the Pokéman craze is popular specifically with children of elementary school age. Not only are our children using the Internet in growing numbers and with increasing ease — but its use is forcing other interests out. And this, primarily, is the concern I raise.

The disciplines I teach, multimedia, 3-D animation, and video, have always depended on a merging of creativity and technology. My students at Fairleigh Dickinson University need to learn technical tools as well as bring their own aesthetic sense to their projects. Their success in the classroom, and ultimately in the job market, depends on their ability to synthesize their artistic and technological expertise. My experience indicates, however, that they are making great inroads into technology often at the considerable sacrifice of art.

Technology seems to be replacing pure graphical skills in students' minds. While, as I noted in my 1997 article, "The Effect of Technology on Aesthetics: Our Students and Their Approach to Art-Based Curricula," there is no doubt that the computer affords the user the ability to draw straight lines and perfect circles, it doesn't provide the understanding one needs to show the movement of muscles beneath the skin. You can't yet depend upon a computer to draw a perfect human being, complete with correct proportions, and make that human being look natural as he stands, sits, or runs. Even the best computer programs available today can't quite duplicate facial expressions well. We can discern the difference between a video or a photograph of a person versus a computer-generated animated version, even using the sophisticated 3-D animation software currently available.

From what I have observed, along with others in the field, is that we need to spend more time on the basics. Students still need to learn rudimentary drawing techniques, the human form, and design. As Michael Sullivan wrote in a 1996 article for *Electronic Tools and Trends*, "The Sorry State of Design Education," the "new type of design graduates emerging from our colleges and



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universities," ..."simply aren't able to master the vast array of tools needed to perform today's design jobs." Why? Because our students, in imitating the computerized, animated commercials on TV, or the fantastical images in the movies have depended on their computer applications to bridge what they lack in true artistic skills.

Among the art-based courses I teach, two use Kinetix's 3-D Studio MAX. Although all of my students must have some basic grounding in computer techniques before taking any of these courses; strangely, they do not always take basic art courses first.

Many of these students rely on the ability to "shortcut" their way to a finished design or multimedia piece. It takes less energy and personal investment for them to search the Internet for applicable graphics, video, audio clips, or animations, and to use these to supplement their work. So much of this now is easily and readily available on the web. Our classrooms — like the rest of the university, including the dormitories — are wired, allowing them incredibly easy access to perform research and gather information or clips to insert into their papers or projects.

The majority of the students can readily manipulate squares and boxes and photographs from their experiences with software applications such as Adobe PhotoShop. Because these computer packages give them the ability to make the elements of their designs "perfect," they can approach something that looks right to the untrained eye very quickly. That in and of itself creates a problem for these students – because everything comes together so fast, many have never learned to struggle with a design. They feel it is complete long before it truly is.

When these students create a beautiful, animated object, the finished product often doesn't fit well into its natural environment. Many of the nuances and details are missing. The animated objects don't run smoothly. Again, relying on the software as a way to shortcut the process, the students recycle the three or four seconds' worth of frames that they have the patience to create, and expect it to carry the design. Obviously, the repetition is immediately discernable and is viscerally labeled artificial.

As the exception that proves the rule, one of my students created a wonderful 3-D rendering of a kitchen interior. What differentiated this one student's work from the others was the immense care that he took with the lighting. Having spent a considerable amount of time designing the kitchen and applying various surfaces to make it look just right, he then realized that he needed to illuminate them in precisely the right way, to evoke the appropriate feeling. Wanting his kitchen to appear as if bathed in the warm glow of early evening, right after the lights had been lit, with a bit of dimming sunshine still coming in from outside, he had to work for an additional week just on the illumination. He had an innate understanding of how the light needed to bounce off the various surfaces, and so he added numerable hidden lights where none would exist in nature to provide the desired effect.

While this student was used to working on computers, he was also a trained artist, with a background in color and light theory as well as practice. When it came time to translate his artistic vision into a 3D rendering, he knew it wasn't enough merely to use the computer tools to create a scene. Had he not taken the time with the lights, his scene would have been well-executed, but devoid of that extra bit of artistry that made you instantly aware on a subliminal level of the time of day and the mood.

The creation of a work of art, whether animated or not, must be true to its own internal rules. Yet, because computer students today have access to so many digital enhancements, they tend to apply them for the sake of the "effect" rather than judging whether or not the enhancements are in fact a constructive part of an integrated design.

For example, one of my students put together a comprehensive multimedia presentation on restoring antique cars. Because the student was not used to thinking in the non-linear fashion that the web and other multimedia applications allow, he forced his users to move through the presentation viewing every screen provided. This mistake in judgement was amplified because the student had learned enough about computer effects to add in audio, video, and all of the options for each individual car. The cumulative affect of being forced through these features for every car very quickly annoyed the audience. What could have been effective when used judiciously – or when giving the user the ability to choose which effect to view – became merely "noise" that hurt the totality of the presentation. When our students today cease to think about the affect a computer-generated element will have on their audience, and think instead about what a "cool effect" it is, they are turning themselves not into designers but technicians.

Their orientation towards either Windows or Macintosh interfaces is making it difficult even for the best students to use traditional tools. My film students, for example, find the A-B roll film editors almost incomprehensible. They much prefer to use an Avid, or any similar non-linear computer-based editing system, such as Adobe Premiere, that lets them use the methods they know from using a word processor. These systems allow you to highlight those sections that you want to move up or back, to delete, or to modify slightly. While there is nothing inherently wrong with these systems, it is sobering to consider how our arts students may be becoming programmed to think that only the "cut-and-paste" method can work for them.

Having spent some time teaching primary and secondary school, I have an understanding of one reason why our university students approach their artistic work in this way. The introduction of computers into our classrooms, often to the exclusion of other, more "traditional" courses, such as music or art, are defrauding our youngest students of the opportunities to learn to apply their talents in these fields. Todd Oppenheimer, in an *Atlantic Monthly* article, included some cautionary statistics:

> "The Kittridge Street Elementary School, in Los Angeles, killed its music program last year to hire a technology coordinator; in Mansfield, Massachusetts, administrators dropped proposed teaching positions in art, music, and physical education, and then spent $333,000 on computers; in one Virginia school the art room was turned into a computer laboratory. Ironically, a half dozen preliminary studies recently suggested that music and art classes may build the physical size of a child's brain, and its powers for subjects such as language, math, science, and engineering – in one case far more than computer work did."

This same article speaks of how research papers are cobbled together without thought, how students who attempt 3-D computer generated modeling are creating "a two-D replica of a three-D world. If you took a kid who grew up on Nintendo, he's not going to have the necessary skills. He needs to have done it first with Tinkertoys or clay, or carved it out of balsa wood."

What our students do not realize, in their impatience to sit down at the computer and "just work," is how they are doing themselves an injustice that will hurt them when they want to land that "dream" job. Today's recruiters in the film, multimedia, advertising, and related industries are looking for students who also have traditional design skills. They have seen a lot of the "stiffness or flatness, a lack of richness and depth" that comes from potential employees who are merely computer-based designers. It's not what these prospective employers are looking for. Because I head up my department's internship program, I have done considerable research of my own in this regard. The employers I speak with say, again and again, that they care less about the tools these students know, and are more interested in their ideas, their ability to communicate, and their willingness to embrace new concepts. The students who have been the most successful interns, who have been able to turn their internships into full-time employment, have been precisely this type of student.

Our students need more than just the computer-enhanced graphics courses to make them competent professionals in our discipline. They need also to approach the balance of their studies in our liberal arts curricula to make them better creative artists, because design and creativity are not merely functions of art. You need biology to understand human form, and English literature, history, and religion to understand myth and metaphor and their relationship to our cultural underpinnings. It is only through understanding these and other aspects of the humanities that they can internalize the deeper knowledge that they need to become true artists.

One method I use with all my classes to encourage this type of thinking is to push them back towards research and writing. But there is a real danger here, as cited by Paul Lynch in his "Curricular Management of the Internet: Beyond the Blocking Solution." He says, "Internet resources can and should make learning fun, but not at the expense of the rigors of a learning task that may require higher order skills. The good teacher will monitor student use of the sources, but the landscape of a computer screen changes more quickly than teachers can walk (or run)." For these reasons, I force them away from doing all of their research on the Internet. I agree with Judith V. Boetcher, in her August 1999 article, "The Shift from a Teaching to a Learning Paradigm," when she says:

> "We also need to look beyond our institutions to the full infrastructure for teaching and learning. The global network is now part of our learning infrastructure. The design and development of varied communication tools, well-structured content resources, and effective, flexible, comprehensive, well-structured, accessible knowledge databases are part of this infrastructure."

My experience shows that we have not done a good enough job teaching these students media literacy – and so they are still incapable of honing in on the salient, relevant, and verifiable sources among the thousands they turn up using a search engine. As Karen Hartman and Ernest Ackermann have said in "Finding Quality Information on the Internet: Tips and Guidelines:"

> "Critical thinking skills have always been important to the process of searching for and using information from media such as books, journal articles, newspapers, and radio and television broadcasts. With the advent of the Internet and the World Wide Web, these skills have become even more critical."

Until we have given them the tools to deal with the gibberish available on the Internet, I feel we should continue to point our students towards the traditional libraries, where sources are trustworthy and where the less capable of our students can only copy, rather than "cut and paste" with so much ease.

As my students and I reach the middle of a semester in their 3D modeling studies, just at that point when they become most fixated on the computer screen, I take them outside. Arming them with sketchbooks and drawing pencils, I instruct them to find an object to sketch, and promise them that they will be able to return to their computers later, to translate the object into a 3D image. Almost always, I am greeted with protestation and trepidation. But my students generally find themselves able to transcend their initial fears, and the work they do away from the screen ends up being some of their best work on the screen. It is then that they realize the point of this exercise, that they need to retain their original ability to capture what they see in order to make something look real digitally.

In an even-handed article on the emerging trends in design, Carolyn McCarron speaks of the need for graphic artists to become 'visual communicators.' She quotes Richard Buchanan, head of the School of Design at Carnegie Mellon University, as saying: "We have gradually discovered the core purpose of this branch of the design profession: to communicate. We now work in many media to accomplish our purposes. Sometimes in print, but often in sound, moving images, and complex environments that integrate many media." And she concludes:

> "Varying methodologies aside, the core objective across the educational spectrum remains essentially the same: to teach designers to be effective problem-solvers and communicators in any medium, present or future. Educators confirm that they are training not computer technicians, but thinkers."

Luddite-like railing against the advent of technology would be foolish in the extreme. Technology is here to stay, and we educators must find a way to bring it into our curricula, to enhance the learning that our students do. But we must not give in to the pressure our students bring to bear upon us to make it the exclusive way in which they learn. Specifically in those fields where creativity is to be fostered, we must teach students that the ideas and content of their work must precede and supersede the implementation of the work. Technology helps them implement. Only their own creativity and thoughts can make their work original and worthwhile.

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